STATEMENT OF FINDINGS

Between April and June, 2005, the Corps' proposed Stream Attribute Assessment Methodology (SAAM) was field tested by 12 teams comprised of federal and state agency representatives and private consultants. A total of 49 individuals participated in the field testing. As a result of comments received, the following modifications to the SAAM were made:

1. modified the incision variable to account for aggrading streams;
2. eliminated the water quality and embeddediness variables;
3. reduced the number of numerical choices within the condition categories of the variables, and;
4. modified the descriptors to more clearly distinguish between the condition categories.

The Following is a summation of the comments received from those who participated in testing the SAAM. The comments are sorted by category and the number of participants or teams that made the comment is provided in (parentheses). Each comment is followed by the response from the Corps.

General Comments

1. **"The form is subjective. Reduce or eliminate subjectivity to decrease variance." (5)**

No methodology is truly objective and each investigator brings his or her own unique set of skills and experience to the process. We recognize that there is some subjectivity inherent in the SAAM; but, subjectivity cannot be completely eliminated by any methodology. Our goal is to reduce the amount of subjectivity as much as possible by providing a framework for more consistent evaluations.

This framework for more consistent evaluations is the EPA's Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers: periphyton, benthic macroinvertebrates, and fish. The RBPs are a synthesis of methods employed by numerous state water resource agencies and have been extensively peer reviewed and field-tested across a wide variety of environmental gradients. The SAAM utilizes a subset of variables and protocol**s** from the RBPs as the construct for the assessment methodology. We have considerable experience employing the RBPs in southwestern Virginia. The EPA RBP methodology is routinely used by a variety of professionals to document stream impacts and quantify compensatory mitigation related to surface coalmine impacts. This information is used by the Corps for its Nationwide Permit No. 21 evaluation and it is also incorporated into the Virginia Department of Mines, Minerals and Energy's SMCRA (Surface Mining Control And Reclamation Act) permits.

A more "pure" mathematical derivation of a variable or an assessment approach may appear more objective; however, such approaches can significantly increase the investment in training, time and equipment without a commensurate return in either accuracy (lack of bias) or precision

(lack of variability). For example, earlier iterations of this form included the Bank Erosion Hazard Index (BEHI) as a more quantitative measurement of stream bank erosion. Determining this one variable took substantially longer to run than all the other variables combined. A considerable amount of subjectivity is involved in determining which bank types are present, the number of BEHIs to run and estimating the metrics for the various BEHI variables. This required that the investigators expend longer periods of time taking measurements in the field without necessarily resulting in better information.

Furthermore, increasing quantitative measurements does not necessarily reduce variability. Variability is more a function of experience with using the methodology and as with any new procedure, training and repetition will reduce variability. This was equally true when the Corps' 1987 Wetland Delineation Manual when it was first introduced and there was little familiarity with it.

At the outset we recognized the testing participants would have a wide range of experience in stream assessment from stream design experience to no experience at all. For the majority of participants, it was their first time running the SAAM under field conditions.
Therefore, variability in results on the initial run of this form was expected. However, as stressed above and based on comments received, we have changed the form to clarify certain aspects and reduce the variability. We feel that these changes, in addition to training and repeated use of the form, will significantly reduce variability between individuals.

2. "Need more training on use of this form." (4)

We concur. The Corps and DEQ staff will be given an overview on the use the final SAAM form , who will then guide use of the form by applicants and consultants.

3. "Too many number choices for the variables (1-20)". (4)

We concur, and have reduced the number choices.

4. "Form is easy to use and will get easier after practice. Our team was pretty consistent " (4).

We concur.

5. "Form should be applied or adapted for use and tested throughout the State, not just the Piedmont." (3)

We concur. However, changes will be required to the form in order for it to be applicable to the Coastal Plain and Mountain regions.

6. "The condition of the reach is just a snapshot, while knowledge of the history and present land uses allow a clearer understanding of what's going on. [How can/should past and future potential impacts be better considered in this]?" (4)

While we do not advocate ignoring site history and land uses, we are concerned that trying to incorporate them into a crediting methodology would make it overly complex. These factors are more suited to the overall project suitability of mitigation sites, and less to the specific crediting. We intend for the SAAM to evaluate the conditions present at the time of the evaluation.

7. "Clarify descriptors to make them more distinguishable." (4)

We concur. Descriptors for several of the variables have been rewritten for better clarification and specificity.

8. "Evaluate consistency and repeatability of the form before deciding on its use." (3)

We concur, and are doing so via the testing.

9. "Reference (baseline) streams should be established and the form run on them to use as part of this method." (2)

We concur. Throughout this process, we considered reference sites, and also generally consider the test sites as potential reference sites. We will continue to develop the concept of reference sites, to aid in standardizing and training.

10. "This form should be tested from a baseline using truly natural streams versus obviously manipulated streams" (1)

In selecting the testing sites, we chose sites that ranged from relatively undisturbed (Prince William Forest Park) to highly disturbed (Reedy Creek).

11. "The old form is easier to use. This one is cumbersome." (2)

The 'old form' referred to ranked streams based on 6 variables and scored each variable from 1 to 3. The new method also contains 6 variables and similarly will be easy to use.

12. "Consider automatically scoring for certain conditions; for example: seeps as optimal, and concrete or ag channels as poor. Also recommend greater consideration be given to presence of wetlands and/or floodplains" (2)

The form has been changed so that certain condition categories, such as channelized streams lined with concrete, riprap, gabions, etc., are automatically scored low. Furthermore, the SAAM is only used when the Corps determines mitigation for permitted impacts is necessary. Wetlands are already captured in the Riparian Area variable and floodplains are addressed in variables 1, 2, 3, and 4.

13. "This form could potentially be used to evaluate stream condition, but I don't believe it could be used to estimate post-impact condition. You most likely would not be able to estimate bank stability, in-stream habitat, or embeddedness/sediment deposition." (1)

We disagree. The SAAM can be used to assess a post-impact condition when appropriate. For example, a stream proposed for channelization can be evaluated with the SAAM prior to the work and then assessed post-construction to quantify the impact to the overall stream RCI. Agency Project Managers must use best professional judgment to determine secondary and indirect impacts.

14. "Some metrics are so closely related that it seems that they're being scored twice, (for example "sediment deposition and bank stability, and incision and bank stability)."(1)

Some variables are closely related; however, that does not translate into a cause-and-effect relationship. For example, our experience has shown that streams exist on the landscape with BHRs of 2.0 and that have stable, vegetated banks. Also, sediment deposition is sometimes a product of upstream sources in the watershed and unrelated to either bank erosion or incision. During the development of this method, we have thoroughly considered the double counting concerns, and are comfortable with the variables and associations of variables in the current version. While it is true that many of the variables are related to each other in some fashion, all of them taken together provide a more complete determination of the stream's condition.

15. "It would be valuable to give a baseline score for what a "0" would be for each variable." (1)

We agree that such guidance is helpful and will provide it in the Instruction Manual, however, we generally leave that to the Project Managers.

Variable-Specific Comments

I. Channel Incision

16. "Many people have difficulty identifying top of lowest bank, and especially, bankfull accurately. (7).

We concur. Training and repetition of use will be important on the use of the SAAM. We also will include more photographs in the Instruction Manual (IM).

17. "For certain channel types, such as concrete channels, trampled banks, or incising channels, bankfull indicators might be absent or unreliable. Therefore, can't determine Bank Height Ratio accurately." (5)

We agree the BHR may be difficult to determine under some conditions. For troublesome sites, such as banks trampled by livestock, we have added language that recommends the investigator walk up and down the SAR and beyond, to look for corroborative evidence of bankfull indicators. The SAAM will only be used on those projects the Corps determines will require mitigation; therefore, the SAAM would not be used to determine impacts to concrete or gabion lined channels if no mitigation would be required.

18. "Sketches and a better description for these two parameters and where measurements should be taken would be helpful." (2)

We concur and have included sketches and photographs in the IM that clarify various stream characteristics.

19. "Bank height ratio adjustment of 3 does not agree with the literature. Factor should be 2 or less." (3)

The change in BHR from 1 to 2 results in a 50 percent change in the CI whereas an increase in BHR from 1 to 3 is only a 33 percent change even though incision is significantly greater. We believe adding the adjustment factor helps to capture the severity of the incision as the BHR increases. In addition, our field observations revealed that many streams in the Piedmont Physiographic Region with a BHR of approximately 2 were extremely stable.

20. "Need training on identifying bankfull and top of lowest bank." (3)

We concur.

21. "Aggrading channels score too high using this variable." (1)

We concur. We have changed the SAAM so that aggrading channels; i.e., those with a BHR < 1.0, will receive a lower Condition Index just as those that have a BHR > 1.0. Also, indirect effects of aggrading channels would be picked up in other variables, for example, epifaunal substrate and sediment deposition.

22. "Bankfull can only be accurately determined by using gauge data and/or regional curves.. Also, the NC Rural Piedmont Curves provide fairly accurate validations of field identified bankfull stage at less urban sites " (2)

It is true that gauge data and regional curves are the most accurate way to determine bankfull for some streams. However, regional curve data or gauge data are generally unavailable for many of the streams we deal with under Section 404 of the CWA, especially the upper reaches of intermittent streams, where the majority of regulated impacts occur. The SAAM is a regulatory tool and for purposes of this methodology, we believe that field indicators allow us to make

reasonable regulatory decisions in the absence of either regional curve or gauge data. The BHR determined by the SAAM is not intended as a substitute for more detailed and specific information necessary for proper channel design criteria. The North Carolina State University has published an excellent discussion on identifying field indicators of bankfull stage in its River Course Fact Sheet Number 3: Finding Bankfull Stage in North Carolina Streams. We have included this publication in the appendix of the IM.

23. "Allow PM to go up or downstream of SAR to determine bankfull if no reliable indicators are in SAR."

We concur, and have changed the IM to reflect this.

24. "This variable is a good indicator of stream condition most of the time." (1)

We concur.

25. "Score adjustments to the riparian corridor and channel alteration when the bank height ratio is >3 is a good idea." (1)

We concur.

26. "Most streams in Virginia, especially the Piedmont, are incised. Should this attribute be given so much weight?" (1)

We agree that past land use practices in Virginia have had a significant impact on the state's streams; therefore, the SAAM is intended to measure relative condition based on least disturbed conditions, not pristine or pre-European settlement conditions. As such, the methodology fully recognizes and accounts for the fact that most streams in Virginia are incised. Also, incision is an important factor effecting overall stream condition and health and its inclusion in the SAAM is warranted.

II. Riparian Areas

27. "Overall, our team had good agreement in scoring this variable." (1)

We concur that this variable is relatively easy to measure or estimate.

28. "What regulatory authority exists for requiring mitigation for impacts to a 100-ft buffer? Does the applicant need to mitigate buffer along a stream that currently lies outside of an RPA? Also, flow regime (intermittent/perennial) isn't considered." (1)

The Corps does not regulate activities in uplands. We do, however, regulate stream impacts, require permits for most types of work in streams and can require mitigation for stream impacts. Permit decisions and the type and amount of mitigation are partially predicated on stream

condition; and riparian buffers are integral to stream condition. Therefore, regulatory decisions pertinent to impact assessment and mitigation must factor the riparian buffer into the decision making process. As an example, the Corps does not have jurisdiction over the trees in forested wetlands; however, forested wetlands are evaluated differently than emergent wetlands. Permit decisions, including the type and amount of mitigation, are based on those differences.

With respect to intermittent and perennial streams, we see no reason to differentiate between the two when assessing impacts and mitigation requirements.

29. "There is a large variation in the way evaluators looked at this. Some lumped land uses; other split land uses." (1)

We agree and have rewritten the descriptions so that differences in landuse are more distinguishable between the different condition categories.

30. "This part of the form is not user-friendly in the field and should be simplified. " (4)

See response to no. 29, above.

31. "I like the way this part is set up. I believe it allows for much more accurate assessment of buffer quality." (1)

We concur; however, we also recognized the need to provide better clarity and have rewritten the descriptions.

32. "Concerned about "Suboptimal" including "recent cut over". Should it be Marginal? Not sure this is better than Dense/ non-maintained herb cover." (1)

Cutover has significant woody material below the ground surface, and often some leaf litter remaining. Shrub density recovers quickly after tree cutting, reducing the long term effects of logging. Further, we do not want to encourage cutting of riparian buffers solely to reduce mitigation requirements or provide greater mitigation lift on mitigation projects.

33. "Buffers should be weighted differently, according to position in relation to the stream." (1) (*Editor's note*: i.e. whether there is 50 feet of buffer and then concrete, or whether there's concrete and beyond that 50 feet of buffer, it would be scored the same)

While there may be some merit in such an approach, we have not found a practical way to address it at this time.

34. "What is a "mature forest", as most of VA has been logged? What constitutes sparse coverage?" (1)

We have rewritten this variable so that Optimal condition reads: Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover. (Additional forest layers may include: sapling, shrub, herbaceous, and leaf litter including mosses/lichens and woody debris.) Score at the high end of

optimal range if > 2 additional layers are present. Score at low end if < 1 additional layers are present. The other condition categories have similarly been rewritten in order to clarify the meaning.

35. "Where does the riparian measurement start for concrete channels?" (1)

It would start at the top edge of the concrete rise on each side. However, the SAAM is only used when the Corps determines mitigation for permitted impacts is necessary.

III. Bank Stability

36. "People have different ideas about what eroding banks are/ Bank stability is subjective." (3)

Determining bank erosion can run the gamut from qualitative assessments to detailed measurements utilizing bank pins, bank profiles, vertical velocity profiles, shear stress and near bank stress calculations. The SAAM is a regulatory tool and its purpose is to provide a relative assessment of bank erosion upon which to base regulatory decisions. For this reason, we have opted for the qualitative assessment as outlined in EPA's RBPs. We have added photos in the IM that clarify various erosion categories. Also, training **and repetition** will similarly minimize the variability between investigators.

37. "Why isn't a concrete channel considered stable? Or is it rated poor for lack of natural bank and bed? Recommend deleting concrete/gabion channels from "Poor" category." (3)

The SAAM is a regulatory tool to differentiate between least disturbed and most disturbed streams. Granted, concrete, riprap or gabion lined channels are stable but are also on the extreme end of the most disturbed condition. Such channels have lost virtually all stream functions, therefore we will continue to rank these channels as poor.

38. "Bank Stability variable should only be one number." (Each bank counting as half) (1)

The Bank Stability variable is only one number and each bank counts as half.

39. "Bank Stability requires speculation on future activities within the watershed and opinion regarding erosion potential during floods" (1)

We disagree. Regulatory decisions regarding stream impacts are based on existing stream condition, not a speculative condition based on future changes in the watershed. However, we do agree that watershed condition and future build-out of the watershed are important factors when considering appropriate stream mitigation sites. Stream restoration and/or instream structures must be designed to accommodate future changes in the watershed in order to ensure long-term stability.

40. "Knowledge of past or future activities could influence score. Should the 'potential' drive current assessments?" (1)

See # 39 above.

IV. Instream Habitat

41. "Habitat is subjective. Our team had highly variable scores, depending on experience in sampling benthos." (3)

Instream habitat and available cover are visual estimates of the abundance and variety of submersed structures in the stream. While more quantitative methods exist[1], a visual estimate is generally sufficient for most regulatory purposes. Additional training and experience will minimize the amount of subjectivity and variation

We have purposely stayed away from incorporating any benthic invertebrate analyses for several reasons: 1) the highest potential for macroinvertebrate diversity and abundance is generally during the spring index period (February to March); so its utility as a factor in stream assessment is limited by season; 2) it's further limited as an assessment tool by whether or not there is water in the channel at the time of sampling. The SAAM is operational regardless of water in the channel because it focuses on habitat features not the organisms themselves; 3) collecting and identifying aquatic insects requires a good deal of training, expertise and specialized equipment such as serber samplers, A-frame or D-frame dip nets, kick-nets and dissecting scopes. Additionally, since macroinvertebrates occupy a variety of niches from rocky substrates to leaf packs and large woody debris, a rigorous sampling protocol would be necessary to ensure consistency.

42. "What about areas that have leaf packs but also have sediment building up behind? [Some people score them high if they see these features, thinking that sediment deposition is already accounted for in the next variable; but others recognize that if there is a lot of sediment, then the habitat can't be very favorable.] (3)

Sediment Deposition and Habitat must be evaluated independently. When evaluating instream habitat, one must consider the overall percentages of available cover within the stream assessment reach (SAR). A build-up of sediment behind leaf packs must be interpreted within the context of other habitat structures throughout the SAR and whether or not the other habitat structures are similarly impacted by sediment deposition. The degree to which sediment deposition has impacted all available habitats will be reflected in the percent cover of the

[1] C.W. Hedman, D.H. Van Lear and W.T. Swank, "In-stream large woody debris loading and riparian forest serai stage associations in the southern Appalachian Mountains," Can. J. For. Res. 26: 1218-1227 (1996); A.D. Lemly and R.H. Hilderbrand, "Influence of large woody debris on stream insect communities and benthic detritus," Hydrobiologia 421: 179-185, 2000.

remaining, suitable habitat within the SAR. Generally speaking, as stream sedimentation increases, the amount of instream habitat and available cover decreases.

43. "Consider using a grid-like review of the stream bed to get a more accurate percentage on habitat." (Team 10)

The SAAM is purposely designed to rapidly assess stream condition. For this reason, we believe that habitat can be reliably evaluated by walking the reach and applying the variable descriptors. We will provide, however, a visual guide adapted from the Munsell Soil Color Charts to assist in estimating percent coverage within the SAR. Having said that, nothing in the SAAM precludes an investigator from employing more quantitative methodologies; however, for most regulatory purposes, a visual estimate will suffice. We have clarified in the IM that the habitat variable is evaluated over the entire SAR.

44. "I suggest that either the instructions be clarified to state that the stream you are assessing should be assessed based on the specific conditions of the stream, or that a reference reach is set up as a basis for assessments: (1)

We have clarified this point in the IM. In general, the SAAM has not been scaled to least-disturbed reference streams. Rather, the SAAM is a relative measure of stream condition and presumes that least-disturbed streams will score higher than moderately or most disturbed streams.

45. "Is this appropriate in intermittent streams? "Relationship between habitat and flow regime should be addressed." (1)

Yes. Intermittent streams often have pools, undercut banks, roots, course woody debris, leaf packs, and etc. They also provide habitat for amphibians and reptiles.

46. "There is no biotic component to the assessment. Macro-invertebrate surveys are recommended for determining habitat." (2)

See response to question no. 41, above.

47. "Organisms often don't occur in streams that have habitat characteristics, [or vice-versa]" (1)

Comment noted. Please see numbers 41 and 45 above.

48. "How would riprap be rated?" (1)

If the investigator determines that the riprap provides habitat value, it would be so rated. If the riprap is unstable or disruptive to the stability of the stream, it may rate low. If there is very little of it over the reach, its final disposition would have a truly minor impact on the outcome.

IV. Embeddedness/Sediment Deposition

49. "**High-gradient vs. low gradient is confusing and unclear: how do you distinguish?" (9)**

We concur. We have eliminated references to high and low gradient streams.

50. "Embeddedness is too subjective." (4)

We have eliminated this variable from the SAAM.

51. "Embeddedness isn't appropriate to use for high gradient streams that are dominated by sediment." (1)

We have eliminated this variable from the SAAM.

52. "It is also a problem when the stream is high-gradient, but doesn't have number the riffles complexes it should. The cobbles in those few riffles might not have been embedded, but it's hard to give it a high score when it lacks appropriate complexes. How should this be scored?" (1)

We have eliminated this variable from the SAAM.

53. "What do you do in situations where there is active sediment deposition, but the channel is trying to correct itself? Is this a negative?" (1)

Generally speaking, all streams will attempt to readjust themselves in response to a given impact. However, it is the existing condition of the stream that is evaluated, without speculation as to some future condition. Therefore, a stream experiencing excessive sedimentation is scored accordingly. If the investigator determines the stream is recovering, scoring the stream at the high end of a particular condition category may be appropriate.

54. "Sediment deposition is common in upper watershed, especially for low-gradient streams." (1)

Comment noted.

55. "Low gradient should only apply to Coastal, wetlands, blackwater systems where glide-pool occurs naturally." (1)

Please see response to question no. 49.

56. "Slope is a better way to distinguish high gradient and low gradient, or should at least be considered when attempting to distinguish." (4)

Please see response to question no. 49.

57. "What is the purpose of this variable, and is this not addressed under Habitat?"

Poor habitat can result from factors unrelated to excessive sediment deposition. For example, streams that have had the riparian canopy removed either through logging or land-use changes (i.e., forest to pasture) will generally have poor instream habitat because inputs of large woody debris (LWD) and other organic structures, such as leaf packs, have been eliminated or seriously reduced. Also, channelization practices and active debris removal impact instream habitat. Including Sediment Deposition as an additional variable increases the discriminatory function of the SAAM in that it helps identify specific problems. On the mitigation side, greater discriminatory function guides one to better address specific problems and solutions: the solution to poor instream habitat resulting from no riparian canopy will be much different than the solution based on a stream that has been channelized or one that is experiencing excessive sediment loads.

58. "Embeddedness should be determined on the dominant bed morphology, not on one or two 'good riffles.'" (1).

We have eliminated this variable from the SAAM.

59. "Some sites are difficult to determine: are the finer particles supposed to be there, or are they the ones doing the embedding? Further reconnaissance of the upstream watershed may be needed…therefore these sites may not be scored appropriately" (1)

We have eliminated the embeddedness variable from the SAAM.

V. Channel Alteration

60. "Channel alteration is too subjective and too difficult to determine, without knowing the history." (6)

We have rewritten the descriptors in order to obtain a greater level of discrimination. The IM includes additional discussion on this variable for better clarification.

61. "How do you handle the question of engineered alteration vs hydrologic modification, or indirect impacts caused by additional input?" (6)

We concur that a hydrologic modification, such as additional runoff input, can alter a channel as significantly as an engineered alteration; therefore, we have rewritten the variable description to include language addressing hydrologic modifications.

62**. "How should altered channels that have recovered be scored?" (1)**

In general, altered channels that have recovered are scored in the Suboptimal category (see the descriptions on the SAAM form).

63. "Our group had good agreement in scores, but more guidance would be helpful" (1)

Please see numbers 60 and 61 above.

64. "Wording is confusing for this variable. Disagree that streams that have been dredged more than 20 yrs ago should not be given a score less than Suboptimal. Severity of the alteration is more important." (1)

We concur and have eliminated the 20 year threshold from the description.

65. "Consider dropping this variable." (1)

We believe this variable is an important aspect of stream condition. Channel alteration is a perturbation encountered on the landscape and it's important to distinguish between streams that have been altered and those that have not. Mitigation for impacts to unaltered streams should be greater than impacts to altered ones. Including this variable increases the discriminatory power of the SAAM.

VI. Water Quality

66. "The entire watershed affects water quality and should be considered, not just the SAR. (5)

67. "This variable is a guess and is highly likely to be inaccurate." (4)

68. Should use biological (presence of EPT macroinverts) and/or chemical (water quality testing like pH) parameters for this

69. "Consider using whether or not the stream is on the 303(d) list in helping with this determination."

70. "The language for this variable is contradictory. Clarify whether to look only in SAR, or upstream of SAR as well." (2)

71. "Consider using a percentage of development within the watershed in helping with this determination" (2)

72. "Approach this from the standpoint of contamination: Obvious, visual observations sources (sheen, floc, odor) rank lowest; potential sources or suggested evidence (e.g. coloration) ranks middle; and no source and vegetated watershed highest." (2)

73. "How do you assess the watershed? Aerial? Quad?" (1)

74. "There seems to be a focus on the absence of negatives rather than presence of positives for this variable." (3)

75. "What does 'natural condition' mean?" (3).

76. "Although an important consideration, it may be impossible to get an accurate score, or may not be worth the effort. Consider dropping this variable." (2)

77. "This variable is time dependant. For example, if a farmer removed cattle from a stream a season before the assessment, will he be penalized by a reduction in mitigation lift if the stream rebounds over the course of a year. This could encourage a 'race to the bottom' to gain the most mitigation lift." (1)

78. "This is an extremely important parameter; not to address it, or to address it poorly, might invite litigation" (1)

Because of the comments received and the inherent difficulties associated with this variable, we have decided to eliminate it from the assessment.

COMMENTS ON SPECIFIC FORMAT OF COMPUTER FORM

79. "Include space for notes/professional judgment." (2)

We have added space for notes.

80. "Include space for stream width." (1)

We have added this attribute to the SAAM form.

81. "Add a field under Embeddedness to allow users to place the value in its appropriate location (under Embeddedness or Sediment Deposition, as appropriate)" (1)

We have eliminated the Embeddedness variable from the SAAM.

82. "Riparian boxes should be coded to pick up the SAR length that's already entered once." (1)

We have restructured the formula for the Riparian Area CI and entering the length of the SAR is no longer necessary.

83. "For Bank Stability, the current formula is LB + RB/10. I believe the 10 should be replaced with a 20?" (1)

That is correct and we have made the change.

84. "I do not like that the form is in Excel—have to re-enter it on computer." (1)

We modified the forms to include a blank form for field use and an automated computer form that performs the calculations. If an investigator prefers to complete all the field calculations on a hand calculator or in long form, that is at the investigator's discretion. We believe that Excel is a readily modifiable and convenient tool, which will reduce mistakes and save time.

85. "We cannot circle purpose of stream eval on form. Suggest making check boxes in PDF format." (1)

We concur. We have indicated that the purpose on the computer form should be made bold.

MITIGATION ANALYSIS/LIFT FORM

86. "How will this methodology be used to generate mitigation ratios and evaluate compensation on a consistent and reliable basis?" (1)

The SAAM Form 1 is run on the pre-mitigation stream, just as one would run the form on the impact stream, to determine the base RCI. Once that is completed, decisions can be made on which variables can be improved and how much improvement is possible. For example, if Bank Stability of the pre-mitigation stream revealed 65% of the banks eroding (Poor category), the mitigation goal is to repair the erosion such that < 5% of the banks are eroding (Optimal category). A conceptual mitigation plan would address each variable in this way as a means to estimate the net increase in the RCI. Once this has been determined, the length of stream necessary to achieve no net loss of function can be calculated. While improvements to most variables can be measured, as in the case of Bank Stability, others must be estimated using best professional judgment. Improvements to Sediment Deposition, for example, must be predicted based on the conceptual mitigation plan. It's reasonable to assume that, if 65% bank erosion is reduced to < 5% erosion, Sediment Deposition will improve. The project manager and the applicant would discuss the degree of improvement, based on the conceptual mitigation plan, and arrive at an agreed upon condition index for that particular variable. Detailed project plans would not be developed until decisions and assurances about final crediting were agreed too based on the conceptual mitigation plan.

We have developed SAAM Form 2 for to guide project managers and applicants in assigning the appropriate score to the variables based on the conceptual mitigation plan. The ratios are automatically produced by the formulae in Form 3. The IM outlines the use of the forms and the steps involved when determining impacts and mitigation.

87. "You most likely would not be able to estimate Bank Stability, Instream Habitat, or Embeddedness/Sediment Deposition based on a mitigation plan. You cannot design for a certain % Embeddedness or Instream Habitat. No one knows what to do in order to obtain certain conditions." (1)

We understand the concern. However, the SAAM provides a mechanism by which applicants will get credit for their stream mitigation by taking into account the work the applicant is doing and by how much it is likely to improve the mitigation stream reach.

We have provided in the Instruction Manual the minimum information requirements for conceptual stream mitigation plans, and guidance for interpreting and assigning credit based on those plans. Using this information, PMs would assign credit accordingly.

It is true that no one can predict with absolute accuracy how successful a stream mitigation project will be overall or for each particular variable. This is why applicants are required to conduct monitoring on all mitigation sites. So while credit is assigned upfront, the monitoring results over time will show whether or not the mitigation is achieving its intended outcome based on the credit assigned to it and agreed to by the applicant. If it is not, then the applicant must do corrective work to ensure that it does. As with all mitigation, it is the applicant's responsibility to maintain compliance with requirements and the credit received.

88. "This method is not repeatable. An applicant and a PM need to know how to fulfill mitigation requirements with a minimal amount of negotiation. The primary disagreement between the COE and DEQ is the mitigation analysis; however examples were not provided for testing" (1)

Please see the response to question no. 86 above. It illustrates how we see the process working. Negotiation is inherent in the regulatory process, whether one is negotiating a jurisdictional determination or the appropriateness of a mitigation proposal. The SAAM is intended to guide the outcome in a predictable fashion.

All comments received were reviewed and fully considered. It is my decision to implement the SAAM as the methodology the Norfolk District will use to assess stream impacts and determine compensatory mitigation within the Piedmont Physiographic Region. We appreciate the effort of those who contributed their time and provided input into the development of the SAAM.

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Date J. Robert Hume, III
Chief, Regulatory Branch